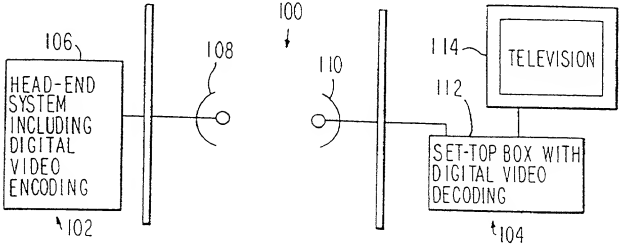
FIG.1


100
106
HEAD-END SYSTEM INCLUDING DIGITAL VIDEO ENCODING
102
108
110
114
TELEVISION
112
SET-TOP BOX WITH DIGITAL VIDEO DECODING
104

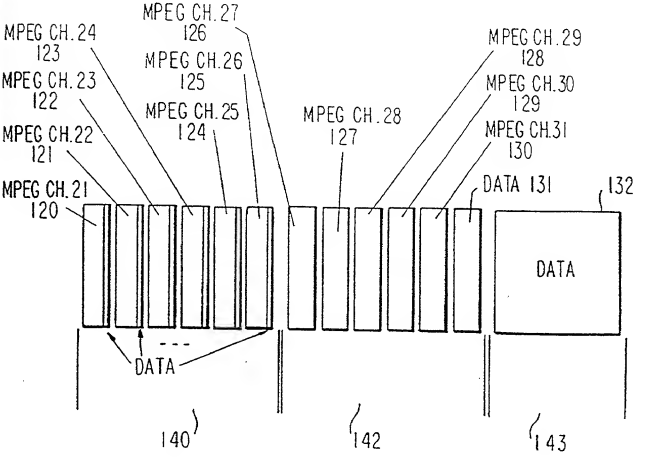

MPEG CH.24
123
MPEG CH.23
122
MPEG CH.22
121
MPEG CH.21
120
MPEG CH.27
126
MPEG CH.26
125
MPEG CH.25
124
MPEG CH.28
127
MPEG CH.29
128
MPEG CH.30
129
MPEG CH.31
130
DATA 131
132
DATA
DATA
140
142
143

FIG.2

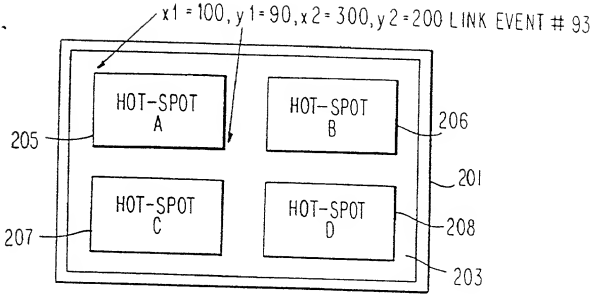

x1 = 100, y1 = 90, x2 = 300, y2 = 200 LINK EVENT # 93
HOT-SPOT A
HOT-SPOT B
HOT-SPOT C
HOT-SPOT D
205
206
201
207
208
203

FIG. 3

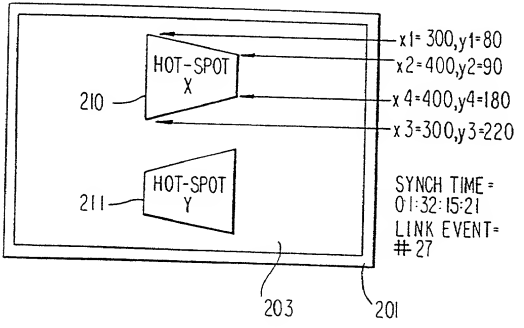

HOT-SPOT X
HOT-SPOT Y
210
211
x1= 300,y1=80
x2=400,y2=90
x4=400,y4=180
x3=300,y3=220
SYNCH TIME = 01:32:15:21
LINK EVENT = #27
203
201

FIG. 4

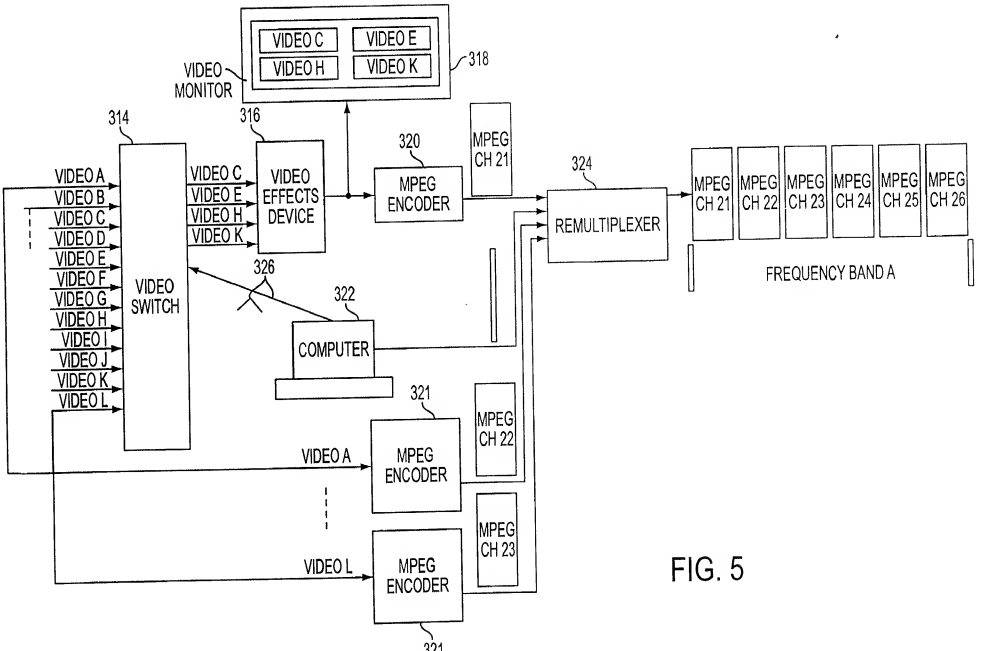

VIDEO C
VIDEO E
VIDEO H
VIDEO K
318
VIDEO MONITOR
314
316
VIDEO A
VIDEO B
VIDEO C
VIDEO D
VIDEO E
VIDEO F
VIDEO G
VIDEO H
VIDEO I
VIDEO J
VIDEO K
VIDEO L
VIDEO SWITCH
VIDEO C
VIDEO E
VIDEO H
VIDEO K
VIDEO EFFECTS DEVICE
320
MPEG ENCODER
MPEG CH 21
324
REMULTIPLEXER
MPEG CH 21
MPEG CH 22
MPEG CH 23
MPEG CH 24
MPEG CH 25
MPEG CH 26
FREQUENCY BAND A
326
322
COMPUTER
321
MPEG CH 22
VIDEO A
MPEG ENCODER
MPEG CH 23
VIDEO L
MPEG ENCODER
321

FIG. 5

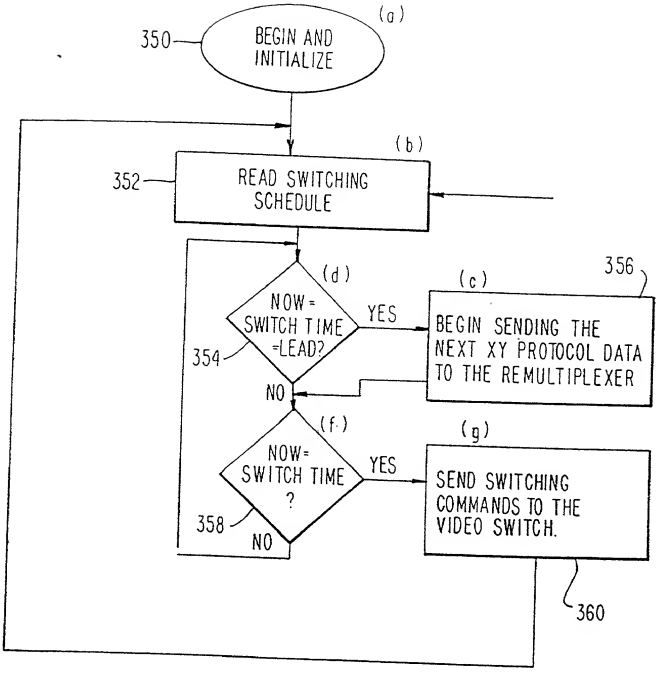

(a)
350
BEGIN AND INITIALIZE
(b)
352
READ SWITCHING SCHEDULE
(d)
NOW= SWITCH TIME =LEAD?
354
YES
(c)
356
BEGIN SENDING THE NEXT XY PROTOCOL DATA TO THE REMULTIPLEXER
NO
(f)
NOW= SWITCH TIME ?
358
YES
(g)
SEND SWITCHING COMMANDS TO THE VIDEO SWITCH.
NO
360

FIG. 6

SWITCHING SCHEDULE

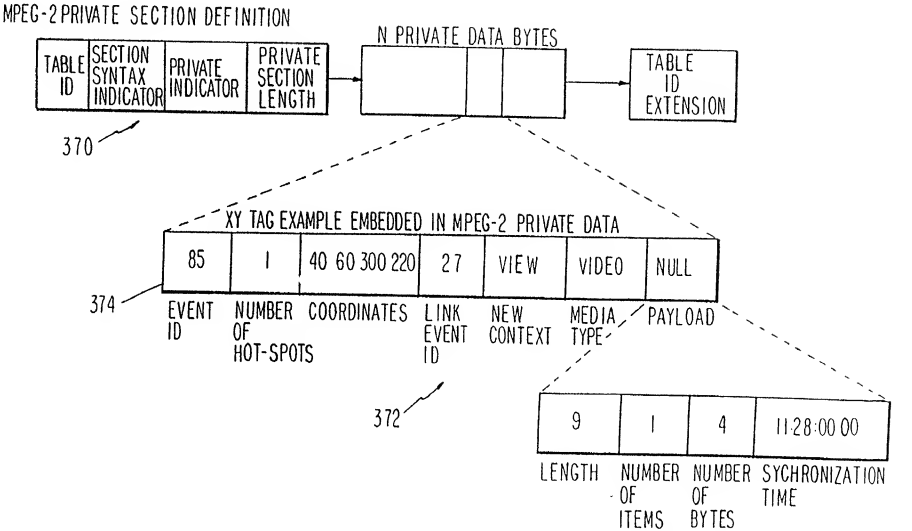
TIME = 11:28:00.00
VIDEO SWITCH C
X1=40, Y1=60, X2=300, Y2=220
LINK EVENT = #27
VIDEO SWITCH E
X1=340, Y1=60, X2=500, Y2=220
LINK EVENT = #29
VIDEO SWITCH H
X1=40, Y1=260, X2=300, Y2=420
LINK EVENT = #47
VIDEO SWITCH K
X1=340, Y1=260, X2=500, Y2=420
LINK EVENT = #42

TIME = 11:30:00:00
VIDEO SWITCH D
X1=40, Y1=60, X2=300, Y2=220
LINK EVENT = #28
VIDEO SWITCH F
X1=340, Y1=60, X2=500, Y2=220
LINK EVENT = #30
VIDEO SWITCH I
X1=40, Y1=260, X2=300, Y2=420
LINK EVENT = #48
VIDEO SWITCH L
X1=340, Y1=260, X2=500, Y2=420
LINK EVENT = #43

FIG. 7

TOSHIBA 2498860

FIG. 8



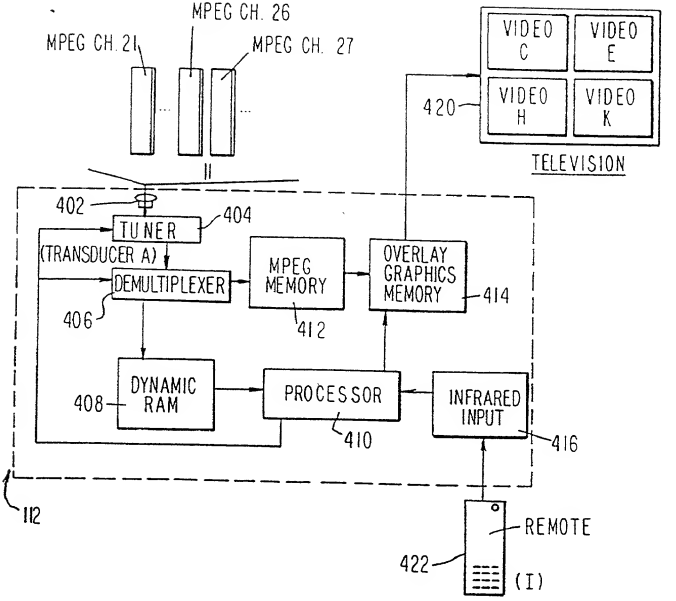

MPEG CH. 26
MPEG CH. 21
MPEG CH. 27
VIDEO C
VIDEO E
VIDEO H
VIDEO K
420
TELEVISION
11
402
TUNER
404
(TRANSDUCER A)
DEMULTIPLEXER
406
MPEG MEMORY
412
OVERLAY GRAPHICS MEMORY
414
DYNAMIC RAM
408
PROCESSOR
410
INFRARED INPUT
416
112
REMOTE
422
(I)

FIG. 9

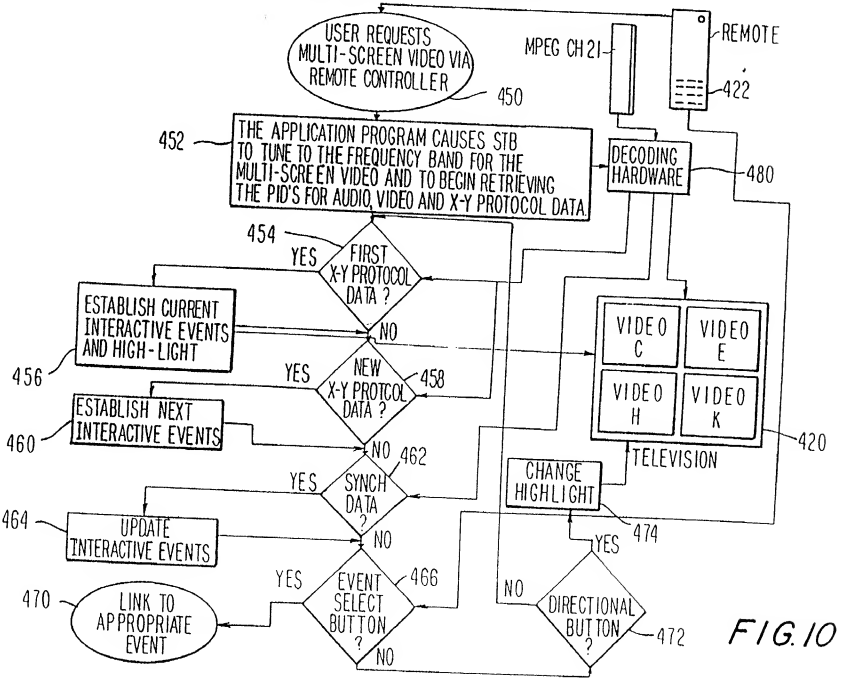

USER REQUESTS MULTI-SCREEN VIDEO VIA REMOTE CONTROLLER
450
MPEG CH 21
REMOTE
422
452
THE APPLICATION PROGRAM CAUSES STB TO TUNE TO THE FREQUENCY BAND FOR THE MULTI-SCREEN VIDEO AND TO BEGIN RETRIEVING THE PID'S FOR AUDIO, VIDEO AND X-Y PROTOCOL DATA
DECODING HARDWARE
480
454
YES
FIRST X-Y PROTOCOL DATA ?
NO
ESTABLISH CURRENT INTERACTIVE EVENTS AND HIGH-LIGHT
456
VIDEO C
VIDEO E
VIDEO H
VIDEO K
420
TELEVISION
YES
NEW X-Y PROTCOL DATA ?
458
NO
ESTABLISH NEXT INTERACTIVE EVENTS
460
462
YES
SYNCH DATA ?
NO
CHANGE HIGHLIGHT
474
YES
464
UPDATE INTERACTIVE EVENTS
NO
YES
EVENT SELECT BUTTON ?
466
NO
DIRECTIONAL BUTTON ?
472
470
LINK TO APPROPRIATE EVENT

FIG. 10